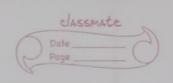


## Practical -3

Write code to simulate sequests coming from dients and distribute them among the servers using load balancing algorithms.

- · Load balancing?
  · Load balancing is the process of
  distributing incoming network traffic
  across multiple servers.
  - No single servers get overloaded.
  - Ath sorvers are used efficiently.
     Systems Stay fast, reliable and
    Scalable
- Load balancing algorithms:
  - 1) Round Robin: Each sorver gets a turn in strict or order.
    - · Maintains a list of an available Server.
    - Server in the list amo and move that server to the end of the list.
    - sorver or ceives orguests in a round robin fashion.
    - . Basic web applications.
      . Druwback: Even if somer is almoder busy, it still gets new request.



2) least Connections: s · Sorver with the fenest active · Maintain a counter for the I number of active connections on each sorver. . This distibutes the workload sequets based on current work locals. · Video straming sorvices, chat server where processing time Ormobucks: Can cause overhead: needs to continuously monitor active connections for all servers.

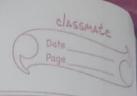
Slower if connections are constantly switching. 3) Weighted round robin:

· Server with higher weight gets

more request: · Assign weights to each server or other relevant factors. 'In a dougd environment with miged sorver size, it some sorver has are more powerful (more RAM, CPU) they are assigned nort work.
Druw back: Fixed weight can't handle changing sorver -) Real Life applications:tace book, y Dutube: have · brough of users, at one millions

rquests

distributed across thousands



sorvers -· Banking applications:- checking balance serroring.
· Uoud systems (AWS, Azure).
· Graming sorvers (PUBG, Fortnite). -) (omponents in code: 1) dientrequest dass: -· Simulates a user request comming to the system. · Each request has: - request - id. - arrival time 2) Server clars: · Simulate a sorver that can handle client sequests. · Each server keeps track of - Active connections & how many client it is amonthy serving. - Total siquests handled. - Weight. when a sorver handy a request it - Increments its active connections - sleeps (wait) for the processing - Decrements active connections after completing: connection is not needed but its used for Lutur upoprade

or charges to wast rapportions

Statstirs, monitoring.

3) Clars Load & Jancer

we are using weighted round robin. - Multithroading: → Multithreading: - Each request is handled on a new thread -> simullating multiple wars interacting with the system at the same time. conditions when multiple thread by
to charge data at the same
time. > Randomners: Client arival times and processing times are random. &